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⑪ Ⓐ No. 955292

⑫ ISSUED Sep. 24, 1974

⑬ CLASS 305-39  
C.R. CL. 305-82

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# CANADIAN PATENT

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SNOWMOBILE SKI ANTI-SKID ASSEMBLY

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APPLICATION No. 181,008  
FILED Sep. 12, 1973

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PRIORITY DATE

No. OF CLAIMS 8

1 This invention relates generally to an assembly to assist in the steering of snowmobiles, and more particularly to a snowmobile ski anti-skid assembly wherein an elongated blade resiliently projects downwardly through a longitudinal slot in the ski to engage the surface over which the snowmobile is passing.

10 Snowmobiles have a common problem in that when the skis are turned to change direction, the momentum of the snowmobile tends to maintain it in a straight line and thereby causes it to skid or slide outward around the corner. The degree of skidding depends upon several factors such as the weight and speed of the machine, the sharpness of the turn, and the prevailing snow conditions, and may be alleviated to a certain degree by the operator leaning into the corner in a well known manner. This problem in steering is particularly severe when the machine is passing over a hard packed or icy surface. In the past, snowmobile skis have been formed with downwardly projecting longitudinal ridges or runners in an attempt to overcome this problem. However, while they have been of some assistance in powder or  
20 soft snow conditions, they are of little benefit on ice.

Accordingly, it is an object of the present invention to at least partially overcome this problem by providing a snowmobile ski anti-skid assembly wherein a thin flat elongated blade is constantly biased downward through a longitudinal slot in the ski to engage the surface over which the machine is passing.

To this end, in one of its aspects, the invention provides a snowmobile ski anti-skid assembly comprising a flat elongated blade and mounting means adapted to spring mount the blade on the ski to extend parallel to a longitudinal axes of the  
30 ski in a normal position with a lower portion of the blade



1 resiliently projecting downward through a longitudinal slot in the ski.

In another of its aspects, the invention further provides a snowmobile ski anti-skid assembly comprising a blade guide fixed to the upper surface of the ski in alignment with a substantially central longitudinal slot through the ski, the blade guide defining a vertical passage therein, the passage having a pair of end portions connected by a central portion to have a uniform dumbbell shaped horizontal cross section, a thin  
10 flat vertically extending horizontally elongated blade with a pair of bolt members extending upwardly from opposite ends thereof, the blade being received in the vertical passage in the blade guide with a lower portion of the blade projecting downward through the slot in the ski and the bolt members located in the end portions of the vertical passage, a pair of coil springs located respectively on the bolt members in the end portions of the vertical passage, a pair of hollow washers fixed to the blade guide respectively in alignment with the end portions of the  
20 vertical passage to provide a stop for the respective coil springs while allowing an upper end of the corresponding bolt members to extend therethrough, the coil springs thereby continually biasing the blade downward through the longitudinal slot in the ski, and a pair of nuts threadably adjustably engaging the respective upper ends of the bolt members to provide a maximum limit on the downward movement of the blade in the guide.

Further objects and advantages of the invention will appear from the following description taken with the accompanying drawings in which:

30 Figure 1 is a partial side elevation view of a snowmobile showing a ski with an anti-skid assembly according to a

1 preferred embodiment of the invention;

Figure 2 is a side elevation view in partial section of the assembly seen in Figure 1;

Figure 3 is a plan view in partial section of the assembly seen in Figure 1;

Figure 4 is a cross section taken along line IV - IV in Figure 3; and

Figure 5 is a cross section taken along line V - V in Figure 3.

10 Reference is first made to Figure 1 which shows the front portion of a conventional snowmobile 10 having a ski 12 with an anti-skid assembly 14 according to the invention mounted on it. While the anti-skid assembly 14 is described and illustrated in regard to a single ski, it is well known that snowmobiles require a pair of skis, and it is apparent that each of them would normally be equipped with identical anti-skid assemblies.

The preferred embodiment of the anti-skid assembly according to the invention includes an elongated blade guide 16 having a vertical passage 18 therein, and a flat thin elongated  
20 blade 20 which is adapted to be received in the vertical passage 18. As best seen in Figure 4 and 5, a conventional snowmobile ski 12 has an upwardly opening longitudinal channel 22 therein and a narrow longitudinally extending ridge 24 projecting downward centrally from the lower surface 26. The ski 12 may be modified to accept the anti-skid assembly by cutting a straight narrow longitudinal slot 28 through it parallel to the longitudinal axis of the ski adjacent the ridge 24. The blade guide 16 is then fixed to the upper surface 30 of the ski 12 in the channel 22 with the vertical passage 18 in the blade guide 16 in alignment  
30 with the slot 28 in the ski 12. As may be seen, a portion 32 of the blade guide 16 is chamfered to enable the blade guide to

1 be received flush to the upper surface 30 in the channel 22 and securely fixed to the ski 12 by conventional means, such as welding.

10 The vertical passage 18 defined by the blade guide 16 has a straight narrow central portion 34 connecting a pair of vertically extending cylindrical end portions 36, 38. The blade 20 has a pair of vertically projecting bolt members 40, 42 connected thereto by connecting pins 44, 46. The blade guide 16 has a pair of hollow washers 48, 50 welded on its top in  
20 respective alignment with the end portions 36, 38 of the vertical passage 18. As may be seen the blade 20 is received in the vertical passage 18 with the bolt members 40, 42 respectively extending upward in the end portions 36, 38 of the vertical passage 18, with upper end portions 52, 54 projecting through the washers 48, 50. A pair of coiled springs 56, 58 are located in compression on the bolt members 40, 42 between the fixed washers 48, 50 and another pair of hollow washers 60, 62 located on the bolt members 40, 42 abutting on the blade 20. A pair of nuts 64, 66 are threaded on the upper end portions 52, 54 of the bolt members 40, 42 to limit the maximum extent to which a lower portion 68 of the blade 20 projects downwardly from the ski 12 through longitudinal slot 28. The nuts 64, 66 are locked in desired positions by a pair of locking cotter pins 70, 72 which respectively pass through the nuts and mating apertures, 74, 76 in the upper end portions 52, 54 of the bolt members 40, 42 to prevent rotation of the nuts on the bolt members. The components of the anti-skid device are normally formed of suitable types of steel, but may also be formed of other suitable strong durable materials.

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1 In use, the blade 20 is continually biased downward by the coiled springs 56, 58 to the normal position shown, wherein the lower edge 78 of the lower portion 68 of the blade 20 engages the surface 80 over which the snowmobile is passing. This edge may, of course, be sharpened to improve engagement with this surface. This is particularly advantageous when the surface 80 is formed of hard packed snow or ice. When the snowmobile 10 passes over a hard icy surface, the blade 20 is raised slightly by contact with the surface. This has the effect of further compressing springs 56, 58 and increases the downward force which they exert on the blade 20, thereby improving engagement of the blade with the surface 80. Nuts 64, 66 may of course be adjusted to vary the degree to which the blade 20 extends downwardly from the ski 12, depending upon prevailing surface conditions. When an obstruction is encountered by the blade 20, coil springs 56, 58 will compress thereby permitting the blade 20 to "ride up" over the obstruction. Rubber bumper 82 is provided to protect the anti-skid assembly 14 in case the ski "bottoms" as the machine passes over a rough surface.

20 As each of the skis of the snowmobile is mounted with an anti-skid assembly, the constant engagement of the blades thereof with the surface over which the machine is passing substantially reduces skidding and improves steering of the machine particularly on icy surfaces. Contact of the blades with paved or gravel surfaces over which the machine passes serves to sharpen the blades and therefore provides that to at least a certain extent the blades are self sharpening in use.

30 Although a preferred embodiment of the anti-skid assembly according to the invention is described and illustrated in the disclosure, it is apparent that there are a variety of

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1 other possible constructions, and it is to be understood that  
the invention is not restricted to this particular embodiment.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A snowmobile ski anti-skid assembly comprising

(a) a flat elongated blade; and

(b) mounting means adapted to spring mount the blade on the ski to extend parallel to a longitudinal axes of the ski in a normal position with a lower portion of the blade resiliently projecting downward through a longitudinal slot in the ski,

the mounting means including an elongated blade guide adapted to be secured to the upper surface of the ski in alignment with the slot in the ski and spring means adapted to continually bias the blade downward to the normal position, the blade guide defining an elongated vertical passage adapted to receive the blade, the vertical passage having a pair of vertically extending cylindrical portions connected by a straight narrow central position, the blade having a corresponding pair of bolt members secured thereto to extend vertically upwards, and the spring means including a pair of coil springs adapted to be located respectively on the pair of vertically extending bolt members, the bolt members and corresponding springs adapted to be matingly received in the cylindrical portions of the vertical passage in the blade guide.

2. An assembly as claimed in claim 1 wherein the mounting means further includes a pair of stop means and a pair of nuts, each of the stop means adapted to be fixed to the blade guide in alignment with a respective one of the cylindrical portions of the vertical passage to limit upward movement of the upper end of the corresponding spring while allowing the upper end of the corresponding bolt member to project upwardly therebeyond, each

Claim 2 contd....

of the nuts adapted to threadably engage the upper end of a respective one of the bolt member projecting beyond the slope means.

3. An assembly as claimed in claim 2, wherein the stop means are hollow washers welded to the blade guide adapted to engage the upper end of the corresponding coil springs while receiving the upper end of the corresponding bolt member there-through.

4. An assembly as claimed in claim 3 further comprising a pair of lock means adapted to lock each nut in a desired position on the corresponding bolt member, thereby establishing the extent to which the blade projects downwardly through the longitudinal slot in the normal position.

5. An assembly as claimed in claim 4 wherein each lock means comprises a pin adapted to be received in matching apertures in the corresponding nut and bolt member.

6. An assembly as claimed in claim 1, 2 or 3 wherein the blade has a sharpened lower edge.

7. An assembly as claimed in claim 1, 2 or 3 wherein the blade and the springs are located in position in the blade guide, and the blade guide is welded to the upper surface of the ski with the vertical passage in alignment with the slot in the ski.

8. A snowmobile ski anti-skid assembly comprising:

(a) a blade guide fixed to the upper surface of the ski in alignment with a substantially central longitudinal slot through the ski, the blade guide defining a vertical passage therein, the passage having a pair of end portions connected by

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Claim 8 contd.....

a central portion to have a uniform dumbbell shaped horizontal cross section,

(b) a thin flat vertically extending horizontally elongated blade with a pair of bolt members extending upwardly from opposite ends thereof, the blade being received in the vertical passage in the blade guide with a lower portion of the blade projecting downward through the slot in the ski and the bolt members located in the end portions of the vertical passage,

(c) a pair of coil springs located respectively on the bolt members in the end portion of the vertical passage,

(d) a pair of hollow washers fixed to the blade guide respectively in alignment with the end portions of the vertical passage to provide a stop for the respective coil springs while allowing an upper end of the corresponding bolt members to extend therethrough, the coil springs thereby continually biasing the blade downward through the longitudinal slot in the ski, and

(e) a pair of nuts threadably adjustably engaging the respective upper ends of the bolt members to provide a maximum limit on the downward movement of the blade in the guide.

Fig. 1.

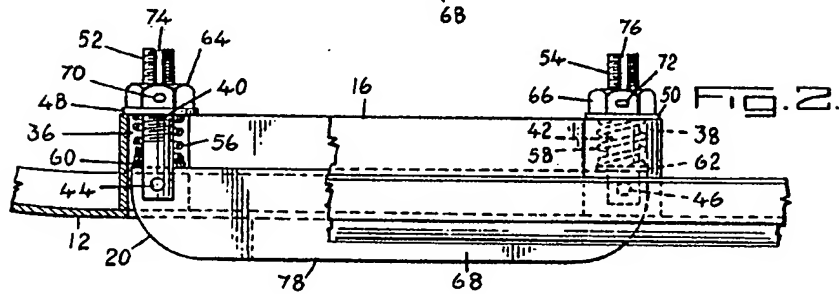
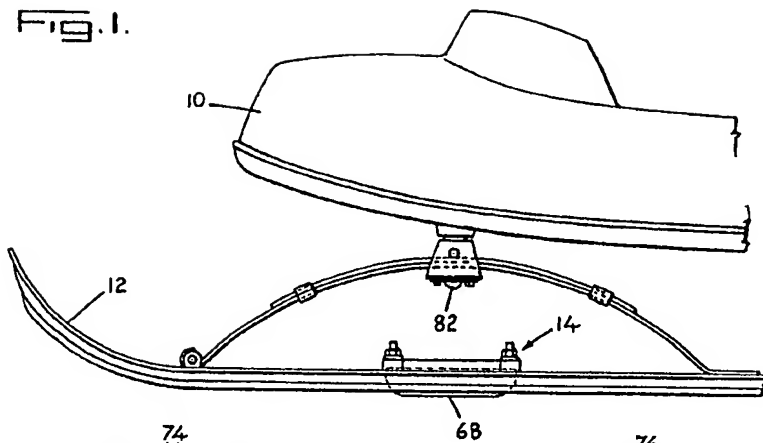
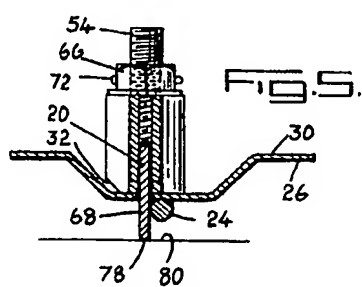
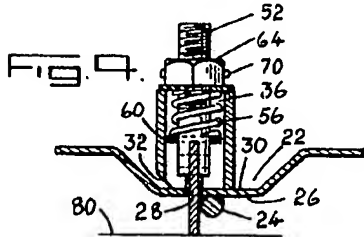
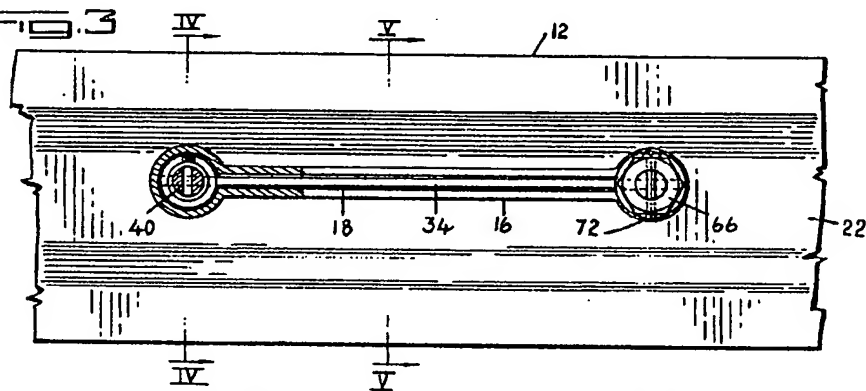


Fig. 3



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